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on June 28 2005

By David E. McConnell

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	:	Date: June 27, 2005
E.A. Corl et al	:	Group Art Unit: 2171
Serial Number: 09/761,939	:	Examiner: M.R. Filipczyk
Filed: 16 January 2001	:	INTERNATIONAL BUSINESS MACHINES CORPORATION
Title: Method, System and Computer Program Product to Partition Filter Rules	:	Intellectual Property Law Department D-YXSA B-002/2 P.O. Box 12195
	:	Research Triangle Park, NC 27709

Brief on Appeal

The Commissioner of Patents
P.O. Box 1450
Alexandria, VA 2213-1450

Dear Sir:

Applicants have given Notice of Appeal from a Final Rejection in this application.

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Real Party in Interest

The real party in interest in this appeal is the assignee, International Business Machines Corporation.

Related appeals and interferences

There are no related appeals or interferences.

Status of claims

There are no claims presented for appeal which use means and function or step and function language as permitted in 35 USC 112 sixth paragraph.

The claims presented on appeal are Claims 1 through 5, 26 and 27. Each of these claims stands under Final Rejection as being anticipated by the disclosures of Irwin U.S. Pat. 6,052,683. Claims 6 through 25 are canceled.

Summary of claimed subject matter

As taught in the present application Background of the Invention, the use of databases in computers and communications networks are well known. In a conventional computer system the database includes a plurality of entries. A unknown item is correlated with the database. If the unknown item matches an entry in the database, a predetermined action associated with the entry is taken relative to the unknown item.

In a communications network, a database may contain a plurality of rules which are applied against IP packets received from the Internet and for other frames received from other communications facilities or devices. Each rule is

associated with a predetermined action. If a rule fits the received packet or frame, the predetermined action associated with the rule is applied to the packet or frame.

The present invention describes in particular a database of rules. The rules are defined as being of two types – "Almost Exact Rules" and "Other Rules". Almost Exact Rules are defined in a discussion of definitions of terminology which begins on page 6 of the present application text at line 16 and continues through page 8 at line 18. The attention of the Board is respectfully directed to this discussion, as it is significant to the invention claimed and to the argument given below.

As stated in that discussion, if the range of values in a component of a rule is exactly one value, then that component of the rule is called an "exact component". If all the components of a rule are exact, then the rule is called an "exact rule" (specification page 7, line 11). It can happen that some rules have ranges of values on only one component of a key. The example given is that there may be a thousand rules in which every component is exact except for the Destination Port number in every rule (specification page 8, line 4). This thousand rules form a set of "almost exact rules". Rules other than those in such a set are "other rules".

The problem addressed by this invention is that a universe of rules in which almost exact rules are mixed with other rules is difficult to enforce at high speed. The present invention overcomes this problem by identifying the almost exact rules in the universe and partitioning the database in which that universe of rules is stored into grouped almost exact rules and other rules.

With the foregoing as background, Claim1 is an independent method claim directed to a method of managing a rules database in which the universe of rules includes both almost exact rules and other rules.

Claim 2 is a method claim dependent upon Claim 1 and which is patentably distinct from Claim 1 by the recitation of a specific search algorithm – a Full Match algorithm – to test packets against the almost exact rules.

Claim 3 is a method claim dependent upon Claim 1 and which is patentably distinct from Claim 1 by the recitation of a specific search algorithm – a software managed tree algorithm – to test packets against the other rules.

Claim 4 is a method claim dependent upon Claim 1 and which is patentably distinct from Claim 1 by the recitation of a specific technology – a content addressable memory – to test packets against the other rules.

Claim 5 is a method claim dependent upon Claim 1 and which is patentably distinct from Claim 1 by a recitation of a specific basis on which a rules database is partitioned.

Claim 26 is a method claim dependent upon Claim1 and which is patentably distinct from Claim 1 by a recitation that the almost exact rules have a particular characteristic – they differ in only one sub field.

Claim 27 is a method claim dependent upon Claim 1 and which is patentably distinct from Claim 1 by a recitation that each of the almost exact rules has a wild card value (see specification page 7, lines 14 et seq.).

Grounds of rejection to be reviewed

Claim 1 has been finally rejected on the ground that the invention claimed is anticipated by the disclosure of Irwin U.S. Pat. 6,052,683.

Claim 2 has been finally rejected on the ground that the invention claimed

is anticipated by the disclosure of Irwin U.S. Pat. 6,052,683.

Claim 3 has been finally rejected on the ground that the invention claimed is anticipated by the disclosure of Irwin U.S. Pat. 6,052,683.

Claim 4 has been finally rejected on the ground that the invention claimed is anticipated by the disclosure of Irwin U.S. Pat. 6,052,683.

Claim 5 has been finally rejected on the ground that the invention claimed is anticipated by the disclosure of Irwin U.S. Pat. 6,052,683.

Claim 26 has been finally rejected on the ground that the invention claimed is anticipated by the disclosure of Irwin U.S. Pat. 6,052,683.

Claim 27 has been finally rejected on the ground that the invention claimed is anticipated by the disclosure of Irwin U.S. Pat. 6,052,683.

Argument

As has been pointed out to the Examiner, a proper basis for a rejection of anticipation under 35 USC 102 exists where every element recited in a claim under consideration can be found within the four corners of a single reference. MPEP Sect. 706.02 (IV). Applicants' undersigned attorney respectfully contends that such a basis is lacking here.

In answering argument on this point in the Final Rejection, the Examiner commented, on page 4, that Applicants appear to have misunderstood the Irwin system. It is respectfully submitted that it is the Examiner who has failed to understand the applicants invention, having failed to read the portion of the specification in which the terminology used in the claims is clarified (pages 6

through 8 as mentioned above).

Turning more specifically to the recitations of Claim 1, the first recitation in the body of the claim sets an environment which the Examiner appears to have ignored. The Examiner has helpfully referred to Col. 1 of Irwin, lines 24 through 29. What is disclosed there, in the Background of the Irwin invention, is that the main step in packet forwarding is to lookup an address in a routing database. The recitation in Claim 1 is that a database of rules is provided. The Irwin disclosure on which the Examiner places reliance provides a database of addresses (mischaracterized by the Examiner as a database of packets). This is a fundamental distinction which the Examiner has refused to acknowledge. On this basis alone, the recitations of the claim are absent from the four corners of Irwin and the asserted rejection under 35 USC fails.

The second recitation in the body of Claim 1 directed to this invention calls for applying an algorithm to identify, within the database, Almost-Exact Rules (the defined term discussed above) from Other Rules. In commenting on this recitation, the Examiner refers to the Irwin Abstract, particularly lines 7 and 10. What is disclosed there is that a binary search algorithm is used for selecting a specific prefix value from (a) prefix search list to structure (an) N-bit input address to form a search value. A search algorithm (e.g. a content addressable memory) is used for performing an associative search on the search value to find the longest matching prefix. As preamble to this disclosure, the initial line of the abstract defines the Irwin invention as (a)n apparatus for performing address lookup ... As the Irwin database lacks any rules whatsoever, it is clear that there is neither a need nor a capability of distinguishing between Almost-Exact and Other Rules and thus this recitation is also lacking within the four corners of the Irwin reference.

The third recitation in the body of Claim 1 directed to this invention calls for partitioning the database so as to group Almost-Exact Rules. The Examiner

purports to find anticipation in Irwin Col. 7, lines 9 through 15. What is disclosed here is that Section 1 of Fig. 5 of Irwin represents (a) lookup table module portion of a search in the form of a 16 bit decoding tree to determine the longest matching prefix for classes A and B network addresses ... Again, the lack of Irwin having Almost-Exact Rules, as defined for this invention, precludes, to the understanding of applicants' undersigned attorney, there being any partitioning of such rules. Determining the longest matching prefix is clearly something other than partitioning out rules.

The fourth and final recitation in the body of Claim 1 directed to this invention calls for partitioning the database so as to group Other Rules. The Examiner purports to find anticipation in Irwin Col. 7, lines 14 through 18. What is disclosed here is that Section of Fig. 5 of Irwin represents (an) associative search module portion of a search in the form of an associative search of network addresses ... Again, the lack of Irwin having Other Rules, as defined for this invention, precludes, to the understanding of applicants' undersigned attorney, there being any partitioning of such rules. Doing a second search based on the result of the Section 1 search is clearly something other than partitioning out rules.

For the reasons stated, it is respectfully submitted that Claim 1 is allowable as defining invention distinct from the disclosure of Irwin.

Claim 2 patentably distinguishes from Claim 1 by reciting the use of a Full Match algorithm to test packets against the Almost-Exact Rules. The Full Match algorithm is the subject matter of an identified related application, co-pending with this application as Ser. No. 09/543,531 and to which the interested reader (including the Examiner) is referred on page 1 of the specification of this application. The Examiner purports to find anticipation in Fig. 6 of Irwin, referring to elements 62 and 66. Element 62 is identified in Irwin Col. 6, line 24 as a binary search module; element 66 in Col. 6, line 52 as a memory module. This skeletal

disclosure is clearly something other than the Full Match search claimed. The referenced portions of Irwin fail to supply the deficiencies pointed out above with reference to the absence of any rules, much less the Almost-Exact and Other Rules with which this invention is concerned.

For the reasons stated, it is respectfully submitted that Claim 2 is allowable as defining invention distinct from the disclosure of Irwin.

Claim 3 patentably distinguishes from Claim 1 by reciting the use of a Software Managed Tree to test packets against the Other Rules. Again, the Examiner purports to find anticipation in Fig. 6 of Irwin, referring to elements 62 and 66. Element 62 is identified in Irwin Col. 6, line 24 as a binary search module; element 66 in Col. 6, line 52 as a memory module. This skeletal disclosure is clearly something other than the SMT search claimed. The referenced portions of Irwin fail to supply the deficiencies pointed out above with reference to the absence of any rules, much less the Almost-Exact and Other Rules with which this invention is concerned.

For the reasons stated, it is respectfully submitted that Claim 3 is allowable as defining invention distinct from the disclosure of Irwin.

Claim 4 patentably distinguishes from Claim 1 by the recitation of using a Content Addressable Memory to test packets against the Other Rules. Here, the Examiner has found a mention of a CAM in Irwin, see Col. 6 beginning at line 19. However, asserting that this disclosure of Irwin relates to testing against rules, particularly partitioned Other Rules as here defined, is a stretch too far. The disclosure simply does not meet the standard necessary for a viable anticipation rejection.

For the reasons stated, it is respectfully submitted that Claim 4 is allowable

as defining invention distinct from the disclosure of Irwin.

Claim 5 is patentably distinct from Claim 1 by the recitation of the database of rules being partitioned as a function of sub-fields within each rule. The Examiner helpfully refers to Fig. 5 of Irwin and element 78. Element 78 is disclosed, in Col. 7 of Irwin at line 3, to be a prefix range tree which illustrates an address partitioning scheme. It is submitted that this function or the method step involved in such a tree, is other than partitioning in accordance with the further limitation recited in Claim 5. The essential points are again missed – it is rules that are being identified and partitioned, not addresses.

For the reasons stated, it is respectfully submitted that Claim 5 is allowable as defining invention distinct from the disclosure of Irwin.

Claim 26 is patentably distinct from Claim 1 by the recitation of the characteristics of the Almost-Exact Rules, namely that only one sub-field in each one of the Rules includes a range of values. This is the characteristic example given on page 8 of the present subject specification. The Examiner helpfully refers to Irwin Col. 7, lines 7 through 9 as supporting the rejection of anticipation. What is disclosed there is that Class C network addresses in the prefix range of /13 to /16 use 8192 decoded addresses out of the possible 65,536 lookup table entries in a 16 bit tree. This fails to disclose Almost-Exact Rules or the characteristic recited in Claim 26.

For the reasons stated, it is respectfully submitted that Claim 26 is allowable as defining invention distinct from the disclosure of Irwin.

Claim 27 is patentably distinct from Claim 1 by the recitation of the characteristics of the Almost-Exact Rules, namely that each includes a wild card in only one component. The Examiner helpfully refers to Irwin Col. 8, lines 21 and

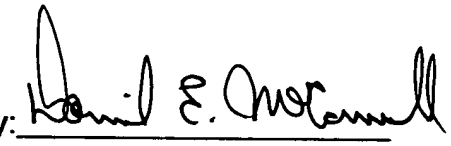
22 as supporting the anticipation rejection. What is disclosed there is that a certain memory location can be empty or can contain a prefix search list to facilitate a search operation. This fails to disclose Almost-Exact Rules or the characteristic recited in Claim 27.

For the reasons stated, it is respectfully submitted that Claim 27 is allowable as defining invention distinct from the disclosure of Irwin.

Claims 6 through 25 have been canceled and are not here addressed.

This Brief is being submitted in the requisite number of copies. The Office is authorized to charge any necessary fees against Deposit Account 50-0563.

Respectfully submitted,

By: 

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Claims appendix

1. A method comprising :

(a) providing a database of rules;

(b) applying an algorithm to the database to identify Almost-Exact Rules and Other Rules;

(c) partitioning the database so that the Almost-Exact Rules are grouped into one or more groups;

(d) partitioning the database so that the Other Rules are grouped in at least one separate group.

2. The method of Claim 1 further including using a Full Match search algorithm to test packets of data received from a network against the Almost-Exact rules in the one or more groups.

3. The method of claim 1 further including using a Software Managed Tree algorithm to test packets of data received from a network against the Other rules in the separate group.

4. The method of claim 1 further including using a Content-Addressable Memory (CAM) to test packets against the other rules in the separate group.

5. The method of claim 1 wherein the database of rules is being partitioned as a function of sub-fields within each rules.

26. The method of claim 1 wherein each one of the Almost-Exact Rules includes a range of values on only one sub-field.

27. The method of claim 1 wherein each one of the Almost-Exact Rules includes a wild card in only one component.

Evidence appendix

There is no supplement evidence to be presented in this appendix.

Related proceedings appendix

There are no related proceedings as to which material is to be presented in this appendix.

AF

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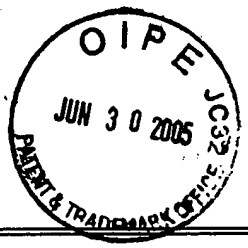

PATENT
Atty. Docket No. RAL920000090US1

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on June 28 2005,
by Daniel E McConnell ***Signature:*** Daniel E. McConnell

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of E.A. Corl et al	:	Date: IBM Corporation - IP Law YXSA/B002 P.O. Box 12195
Serial No. 09/761,939	:	Research Triangle Park, North Carolina 27709
Filed: 16 January 2001	:	Unit 2171
For: Method, System and Computer Program Product to Partition Filter Rules	:	Examiner M.R. Filipczyk

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF
(PATENT APPLICATION-37 CFR 1.192)

Sir:

1. Transmitted herewith in triplicate is the APPEAL BRIEF in this application with respect to the Notice of Appeal filed on June 3, 2005.

2. STATUS OF APPLICANT

This application is on behalf of

_X_ other than a small entity
___ small entity
verified statement: ___ attached ___ already filed

3. **FEE FOR FILING APPEAL BRIEF**

Pursuant to 37 CFR 1.17(f) the fee for filing the Appeal Brief is:

___ Small entity $250.00
_X_ Other than a small entity $500.00

Appeal Brief fee due: $ 500.00_____

4. **EXTENSION OF TERM**

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136 apply.

___ (a) Application petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d)) for the total number of months checked below:

Extension (months)	Fee for other than a small entity
___ one month	$ 110.00
___ two months	$ 450.00
___ three months	$1,020.00
___ four months	$1,590.00

____ (b) Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

5. **TOTAL FEE DUE**

The total fee due is:

Appeal brief fee _____ $ 500.00__
Extension fee (if any) _ $ .00_____
TOTAL FEE DUE ___$500.00__

6. **FEE PAYMENT**

___ Attached is a check in the sum of $ _____
_X_ Charge Account No. **50-0563** the sum of **$500.00**
(a duplicate of this transmittal is attached)

7. **FEE DEFICIENCY**

_X If any additional extension and/or fee is required, this is a request therefor and to charge Account No. 50-0563.

Daniel E. McConnell

By: Daniel E. McConnell,
Attorney of Record Reg. No.: 20,360

Tel: 919- 510 4246 Fax: 919-787-2749